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Enhancing Sustainability in the Agricultural Sector Amid COVID-19: An Implication of the Transactional Theory

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Abstract: COVID-19 impacted lives and business activities across all sectors of the economy, and farmers were no exception. Utilizing the lens of the transactional theory of stress and coping, the present study explores the stressors among small-scale farmers and the strategies they adopted for farm management during the pandemic. This study follows qualitative research design principles and collects the data of farmers from Pakistan on their lived experiences via in-depth interviews. We selected the farmers based on the purposive criterion sampling method, selecting farmers whose farm management practices were affected by the pandemic. The findings suggest that the pandemic created stress among farmers through internal and external factors. The low income of farmers and decline in their yield appeared as internal factors, and hindrances in utilizing resources, strict lockdown measures, worsening supply chain, and market conditions were major external factors impacting farmers emotionally and economically. Farmers utilized their available resources to cope with these factors, i.e., family labor, on-farm labor accommodation, and self-transportation. Nonetheless, farmers demanded the government, fellow farmers, and wholesalers to build a better system to cope with any crisis such as COVID-19. This study provides two primary contributions: First, it provides theoretical contributions to the transactional model of farmers' stress and coping during COVID-19, taking evidence from farmers in the agricultural sector. Second, it provides a comprehensive framework through which researchers, practitioners, consultants, and government authorities can build future scholarship and develop strategies to enhance sustainability and cope with future pandemics.

Keywords: COVID-19; farmers; stress and coping strategies; farm management; transactional theory; sustainability



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1. Introduction

On 11 March 2020, the WHO (World Health Organization) announced COVID-19 as a global pandemic and declared it a contagious disease. The outbreak of COVID-19 affected public health. In September 2020, it infected 29,000,000 people and caused 900,000 global fatalities [1]. Among other affected countries, Pakistan ranked 18th in terms of fatalities as of 3 June 2020 [2]. On 3 December 2020, the death rate in Pakistan was 8205 [3]. Meanwhile, the necessary measures were taken to contain the spread of this virus, including social distancing, quarantine, and lockdown. The country was shut down in the first ever lockdown imposed on 25 March. It continued until 9 May. Afterward, the government

suggested that the public care for themselves by practicing social distancing and avoiding public gatherings. However, the public took it lightly, which resulted in a higher infection rate. The situation compelled the government to impose a second lockdown (stepwise) from the 1st to the 20th of June [2]. These nationwide lockdowns prevented the magnitude of the spread from increasing out of control [1].

The COVID-19 pandemic has wreaked havoc on the global agricultural economy, including Pakistan [4]. Small-scale farmers and informal agri-food system actors have been disproportionately impacted by supply chain disruptions, labor shortages, and reduced agricultural production [5]. This has exacerbated food insecurity and driven more people into poverty and famine. The epidemic reduced economic activity and GDP growth in Pakistan, which was already struggling economically [6]. In the future, the country's emphasis on the "Rural Revitalization" policy intends to accomplish sustainable development targets by 2050 [7]. However, the pandemic's impact and the need for sustainable farming techniques and farmer support systems are critical variables that must be addressed to ensure these long-term goals' success [8].

COVID-19 has affected the world economy, the agricultural sector being no exception. According to the [9], demand and supply affected the agricultural sector this year. Moreover, around one billion people are employed in this sector, and, most importantly, it accounts for two-thirds of the GDP of low-income countries. As Pakistan is a developing country, its agriculture sector contributes to 19% of its GDP and employs around 39% of its labor force (PBS, 2018). Agriculture is not limited to plowing the farm, but it has a vast supply chain, which faced a setback due to the pandemic and lockdown. The more vulnerable participants in this supply chain are the small-scale farmers. They suffered difficulties taking their produce to the market because they lacked laborers and a proper transport system [10].

Selected prospective studies have presented that the COVID-19 interruptions were primarily a threat to agricultural systems. For farming systems in Central America and Mexico, Ref. [11] found that the impact of COVID-19 on mid-sized agricultural systems was particularly substantial. Ref. [12] explored the delicate interplay of linkages between the pandemic and the food systems. They stated that the pandemic has significantly impacted the agri-food systems. An extensive food systems strategy is required to improve the capacity to prevent future crises that might arise from agri-food systems. In order to evaluate the disclosed effects of the pandemic and the resulting coping mechanisms, Ref. [13] examined a sizable collection of smallholder farmer surveys from seven countries in Sub-Saharan Africa and Southeast Asia. They discover consistent smallholder reporting on the detrimental effects of the pandemic on livelihood and food security across these diverse countries. Ref. [14] disclosed information on the food systems in Papua New Guinea, Timor-Leste, and seven Pacific Island Countries. They separated their analysis into implications on smallholder livelihoods, employment, and income to assess the ability to recover the food system. The study reported severe losses in income and employment due to the COVID-19 shocks. Ref. [15] investigated the first effects of COVID-19 and the resilience of China's food system during the pandemic. The study demonstrated that different economies might use China's expertise to combat COVID-19 and create robust food systems during identical pandemics.

Farmers in developing countries such as Pakistan face climate change, transport, health, and financing issues. However, COVID-19 worsens the situation. According to different sources, the pandemic has disrupted supply chains, worsened financial stability, and shaken the already distressed farmers' community [16]. Additionally, Rebecca Roller (PsyD, LMFT, psychologist) stated that "Farmers face a huge amount of chronic stress, from various sources in their everyday life, and this stress can lead towards physical as well as a mental disorder such as depression anxiety" [17].

The literature supports that COVID-19 caused a detrimental effect on the economy and agriculture as well, causing a stressful environment for farmers. The main contribution of this study will be giving timely insights into the sources of stress among small-scale farmers

and the influence of those stressors on the behavior of small-scale farmers in the agricultural sector during COVID-19. Finally, it will explore the coping strategies of farmers with these stressors. Moreover, the theoretical contribution of this paper will be its exploration of the transactional theory of stress and coping.

This study has raised three research questions: What are the sources of stress among small-scale farmers? How has stress influenced the behavior of small-scale farmers in the agriculture sector during COVID-19? Moreover, how have small-scale farmers reacted to these sources of stress?

Section 2 covers the literature review, and Section 3 focuses on the study's methodology. Sections 4 and 5 incorporate the analysis and discussion, respectively. Section 6 concludes and provides policy recommendations.

2. Literature Review

2.1. Literature about Agriculture

An economy consists of three main sectors, namely, the primary, secondary, and tertiary sectors. The primary sector includes agriculture, fishing, and mining. The secondary sector deals with the manufacturing industry. The tertiary sector involves financial services, tourism, and telecommunication [18]. According to [19], in this era, the most developed countries depend on their services sector as it contributes a lion's part to their GDP.

On the contrary, developing countries depend more on their primary sector, mainly agriculture, to support their economy [19]. Pakistan is not yet considered a developed country, and agriculture is the second-largest sector in terms of its contribution to the GDP, which is over 18.9% [20]. Agriculture and rural areas play a vital role in a country such as Pakistan. According to the numbers of the World Bank, around 68% of the population of Pakistan lives in rural areas [21].

Moreover, about 43.7% of the labor force is involved in agriculture [22]. This sector comprises half of Pakistan's labor force and has a significant share in the earnings through foreign exchange [19]. Another study suggested that the production of the agricultural sector is directly related to poverty reduction and the country's sustainable development [23]. Likewise, about 62% of the country's population depends upon this sector for their livelihood [24]. This sector contributed 22.86% and 22.04% of Pakistan's GDP in 2018 and 2019, respectively [25]. According to the reports, Pakistan was facing a decline in the rates of growth of real GDP from 2018 (from 5.8 to 3.3), which was expected to be recovered in 2020, but due to the pandemic and weak financial performance of the country, the rates of growth of real GDP in 2020 worsened [26,27].

2.2. Literature about COVID-19

The novel coronavirus is a type of SARS (severe acute respiratory syndrome), a pandemic first found in the Wuhan region of China. The contagious disease immediately spread worldwide [28]. According to [29], the spread of the coronavirus was so deadly that it caused an overwhelming number of fatalities, and to contain its spread, the government took severe measures such as quarantine, lockdown, and social distancing. This caused many businesses to shut down and caused financial damage to the country's GDP [29]. According to the IMF [30] the world economy is currently in an ongoing crisis that is yet to be resolved, with projected global growth at -4.4% in 2020. These figures are a direct result of the impact of the coronavirus [25]. As the entire world is affected, Pakistan has also experienced the detrimental effects of the virus on its GDP. Notably, for the first time in Pakistan's history, the country ended a fiscal year with a negative growth rate of 0.38% , primarily due to the pandemic, which further exacerbated the country's already fragile financial situation [31]. The virus has inflicted significant harm on both societal well-being and the economy. Research suggests that another wave of COVID-19 is a possibility, necessitating adaptive measures to be undertaken by stakeholders [32].

2.3. Literature about Stress

In the literature, there are many definitions for stress. Hans Selye, M.D., is considered the father of stress research. In 1957, Hans Selye published a book named *The Stress of Life*. His book defined stress as “A non-specific response of the body to a demand”. Stress is our body’s response to any threat, change, or pressure from an inside or outside source [33].

Moreover, [34] defined stress as an individual’s biological response toward any perceived threat to their homeostasis. According to [33], stress has two forms: one is eustress (positive), and the other is distress (negative). There are many studies [35–38] related to both types of stress, but our focus is distress which is a state of imbalance between the demand and the deemed abilities to meet that demand. The novel coronavirus was undoubtedly a stressful time, where the stressors were new, and neither did we have any pre-adaptation policy nor any vaccination or antidotes for post-adaptation policies. High uncertainty about acting in the present and planning for the future generated psychosocial stress [29]. This study focuses on the transactional theory of stress and coping: “Stress occurs when individuals experience demands or threats without sufficient resources to meet these demands or mitigate the threats” [39].

2.4. Transactional Theory of Farmer’s Stress and Coping during COVID-19

The transactional theory of stress states that stress is a process of transaction in which individuals perceive events as threats or losses to their well-being, prompting them to utilize their resources to manage the situation through physiological or behavioral actions [40]. The COVID-19 pandemic and its associated preventive measures have instilled fear in individuals. The lockdown and social distancing measures have also generated concerns about unemployment, income losses, and decreased production and consumption of food, leading to heightened stress levels among individuals [41]. As discussed by [42], individuals in lower and middle-income countries have faced job-related challenges due to COVID-19 and the lockdown, with financial difficulties being a prominent source of stress [41]. Our study explores the internal and external stressors that contribute to stress among small-scale farmers during these challenging circumstances.

Additionally, we analyze the coping strategies employed and suggested by these farmers, drawing on relevant resources. Individuals devise coping strategies to mitigate stressors’ impact, as Ref. [43] highlighted. Similarly, farmers have developed coping strategies during the COVID-19 pandemic and the lockdown, explored in this study, with particular emphasis on problem-based coping strategies.

2.5. Transactional Theory Literature Related to Agricultural Sustainability

The sociological theory called “transactional theory” concerns how people and groups interact. In the 1950s and 1960s, sociologist George Homans created it. Several social phenomena, such as agricultural sustainability, have been explained by transactional theory. Transactional theory can be utilized to explain agricultural sustainability by looking at the connections between farmers and the environment. Decisions made by farmers on how to handle their land and crops can have a big impact on the environment. The use of transactional theory in the study of agricultural sustainability can aid in understanding the intricate and dynamic processes that impact the adoption of sustainable farming practices and can guide the creation of policies and initiatives to advance sustainability in the sector. The relationships involving farmers and other participants, such as customers, governmental bodies, and environmental organizations, can also be understood using transactional theory. To succeed, farmers must make selections that will benefit each group. For instance, producers must produce food that is both environmentally friendly and safe for people to eat. To better understand the intricate interactions between people, groups, and the environment, one can turn to transactional theory. It may assist farmers in making choices that will result in environmentally friendly agricultural methods.

Ref. [44] reveal that farmers participating in carbon offset programs were more likely to employ sustainable farming methods.

3. Methodology

The purpose of this qualitative research was to look at the impact of the formation of stress under the aggregate theoretical themes of the transactional theory of stress and coping [39]. This qualitative study employed the three-step coding analysis procedure that included open, axial, and selective coding stages. The approach described is a commonly recognized and frequently utilized technique in qualitative inquiry, as evidenced by the works of [45,46]. Although the method was adjusted to suit the research objectives, it is crucial to acknowledge that these adjustments were made thoughtfully and were intended to improve the analytical process. The analysis was conducted with integrity and rigor by adhering to the core principles and steps of the three-step coding analysis. The adapted approach was developed after conducting a comprehensive literature review and consulting with field experts. Refs. [47,48] confirmed the modified approach's effectiveness and relevance. By implementing these alterations, we aimed to enhance the qualitative research and furnish significant perspectives on our research subject.

To do so, the mono-method (in-depth interviews) was used. The study covers the factors creating stress among small-scale farmers in Pakistan. So, the sample was collected through purposive criterion sampling. The respondents of the study were small-scale farmers in Pakistan. For the thematic analysis, those interviews were transcribed and coded. The coding process was manual and was done in three steps, as per the suggestions of [49]. The first step was done by creating codes from each sentence of the transcribed interview. In the second step, these codes were combined with the empirical factors. Later, these empirical codes were combined into three aggregate theoretical themes to form a theoretical model.

3.1. Sampling Procedure

The sample of this research was selected through a transition from convenient sampling to criterion purposive sampling. Initially, 50 participants were selected from the Sindh province of Pakistan who were available and willing to participate in this research. As these were the days of the pandemic, approaching small-scale farmers was difficult as many have no connection with technology. So, in the initial phase, convenient sampling from a single province was the only feasible option. In the second phase, we applied three criteria for purposive criterion sampling to meet our research objectives. Firstly, the study is based on small-scale farmers, and according to [50], farmers having 5–12.5 acres of land are considered small-scale farmers. So, the first criterion was the size of land each farmer owned.

Moreover, the second criterion was the impact of COVID-19; the selected farmers from the first phase were contacted and then asked if COVID-19 had any impact on their farm management. The ones who responded affirmatively were selected. Moreover, the last criterion was no fatality in the family during COVID-19. During the pandemic, some people or their loved ones were affected by the disease, so taking interviews and letting people remember their grievances may have produced biased responses. Keeping this situation under consideration, the third criterion was to select the participants who had not gone through any fatality due to COVID-19 in their family. This criterion was set to get non-biased responses from farmers so that they could solely talk about the sustainability issues of their farms. After this whole process, we ended up with 20 participants.

According to Refs. [51,52], the standard sample size for in-depth interviews is 20–30 members of a homogenous group. So, making these standards a benchmark, this study is based on a sample size of 20. We tried to get another response, but after the 16th respondent, we got similar responses for each question. As the occupation of all the respondents was the same, the main issue (the pandemic) was also the same, so no new information became apparent, which meant that we have achieved the saturation point and could stop our data collection [53].

3.2. Data Collection

We have conducted (45–50 min) semi-structured interviews with fifteen small-scale farmers. The interview guide was prepared based on the research objectives. The time horizon of the study was longitudinal (1 September 2020–31 January 2021). The interviews were recorded with the consent of the respondents. Some respondents were not comfortable with recording, so those interviews were noted as memos.

4. Analysis

4.1. Primary Appraisal

4.1.1. Internal

Income

According to the American Psychological Association, people having less income experience higher stress than those who are affluent [54]. The literature reports that farmers from different countries, including the U.S., faced losses in their income during the lockdown [55]. Additionally, a study conducted in Ethiopia reported that lockdowns caused a reduction in crop sales, which decreased small farmers' income [56]. Moreover, a report published by OECD mentioned that there was a significant decrease in farmers' income due to COVID-19 [57]. Likewise, the small-scale farmers of Pakistan also suffered losses in their income. As one of the farmers in our study mentioned,

“Due to the lockdown, we suffered losses. Previously, we were earning one lac on wheat cultivation; these days, the same crop was sold for sixty thousand”.

In proportion to the above statement, farmers faced losses in their income due to the lockdown. Likewise, another farmer said,

“COVID-19 and its preventive measures (the lockdown) reduced our real income. We were compelled to sell our products to contractors and wholesalers at lower rates. As our crops are perishable, the strict lockdown schedule forced us to take non-negotiable lower rates for our crops”.

These losses were not restricted to any one crop. Every farmer producing any crop suffered from these losses. We asked our respondents whether changing the crops can be a preventive measure for these pandemics; in response, they said,

“Changing the crops will not help cover losses, as we produce a variety of crops, and we face losses in every crop”.

There were a lot of grievances from small-scale farmers whose income was affected by COVID-19 and the lockdown. In the days of the pandemic, they had to incur extra expenses for their survival in the field. Many farmers who were not able to meet the expenses suffered severe losses; one farmer mentioned,

“The farmers having their investment somehow managed their losses, but those having no extra investment suffered severe losses”.

Moreover, the unjust rates and quality cut deductions from the market harmed farmers' income. This was expressed by a farmer who said,

“The rates given by the market participant were lower than ever, and the wholesalers used to charge quality cut deductions, which decreases our take-home income”.

This statement shows that the farmers got lower rates and weight deductions for their crops, which caused a reduction in their income. As one of the respondents said,

“Wholesalers in the markets were giving lower rates, 50% lower than before. The crops that were sold for 5000, after 15 to 20 days, the wholesalers were not willing to purchase them at the same rate. So, we had to sell it to the contractors, which gave us 3000 to 3500. However, the market wholesalers were willing to pay only 1500 for the same”.

Production

COVID-19 has raised concerns about producing agriculture in many countries. According to [58], the preventive measures for COVID-19 have disrupted production in China. They also mentioned that these issues are prevalent in developed and developing countries [58]. In India, the lockdown has disrupted agricultural production due to additional restrictions and costs, discouraging many farmers from investing in agriculture [55]. Pakistan is also a developing country and has similar agricultural characteristics to India. Likewise, our study shows similar results. Pakistani farmers have faced many difficulties in production due to COVID-19 and the lockdown. Their production declined, as one of the farmers expressed,

“We got losses in the production averages due to rainfall and corona. Previously where we were producing 10 mun; these days, we can produce 7 muns only”.

According to the respondents of the study, they have faced losses in their average production, and they also mentioned,

“The production was low as the input became expensive due to natural disasters like COVID-19 and heavy rainfall”.

These natural calamities lowered farmers' production, creating stress among them. Due to the lockdown, farmers had few options left to produce and sell their products. As some of the farmers said,

“This year, the yield was very low; previously, we had got 20 to 25 acres of yield, but this year, we only got 4 to 5 acres. Whereas some farmers got zero yields”.

“Input was expensive, so the farmers could not produce at the full capacity of their land. We have productive lands, but the expenses for the production during COVID-19 restricted us from cultivating at less capacity”.

These were the grievances of farmers towards production as a stressor.

4.1.2. External Stressors

External Factors

Some external factors affect every sector. According to [59], natural disasters cause direct and indirect damage to the economy. The indirect damage is caused by the reduced production of goods and services due to the direct damage caused to the infrastructure or the redirection of resources to manage harm [59]. Likewise, the agricultural system of Pakistan has been affected by external factors this year. Our study shows that small-scale farmers have faced direct damage from heavy rains and strong winds, while COVID-19 and the lockdown caused indirect damage. As one of the farmers mentioned,

“Normally, our lands are good in producing wheat and cotton. In 2020, Due to diseases and rainfall, the yield of these crops decreased”.

Their responses show that they had faced losses due to the natural calamity (rainfall) and COVID-19, as mentioned by another farmer,

“COVID-19 has the effect that not all goods are sold in the markets, and there are losses”.

These natural calamities are the external stressors mentioned by the farmers. Moreover, future uncertainty is also a stressor, as mentioned by one of the farmers,

“All these farmers cannot do anything else; they can do farming only. They cannot leave this, but with the circumstances ahead, we do not know what will happen”.

These are the external stressors related to rain, strong winds, COVID-19, and future uncertainty.

Market Conditions

There are different stakeholders in any system. Likewise, the agricultural system of Pakistan has different stakeholders, including the government, wholesalers, farmers, and

buyers. During the lockdown, small-scale farmers faced many difficulties. According to the interviews of farmers, there was no cooperation among the stakeholders, due to which the weaker ones suffered (small-scale farmers). Moreover, the cost of input doubled, which decreased the profits of farmers, as the respondents mentioned,

“... all the fertilizers become very much expensive ...”, “... available at double rates”.

The input cost was higher, whereas the rates they were getting from wholesalers were lower. According to the farmers, the wholesalers were exploiting farmers in the name of COVID-19 and the lockdown. As the respondents said,

“... used to say that crops are not good ...”, “... giving lame reasons ...”, “... made their unions”.

Where there were farmers having grievances with the wholesalers, a respondent also mentioned a positive aspect of them by saying,

“... The rates are predefined, and they wait for us till the roads are clear”.

To promote market fairness and overcome market inequities, the government must intervene in the markets. However, in our case, farmers have seen no cooperation from the government. The government has given no relief to the small-scale farmers in the days of lockdown. Moreover, they have not controlled the rates of the market, as said by our respondents,

“... we have got no support from the government ...”, “... faced many problems due to the government ...”, “... big traders used to bribe the government officials and the poor farmers suffers from this ...”, “... the government should have taken strong steps against those wholesalers who were not giving us the rates which we deserved ...”.

So, according to our analysis, the stressors mentioned above, expensive input, and exploitation from government officials and the wholesalers in the markets are some external stressors that small-scale farmers faced during the days of lockdown and COVID-19.

Supply Chain

The supply chain of every sector starts from its inputs and ends with delivery to the consumer. Small farmers have faced difficulties in every step of the supply chain during the lockdown. As previously mentioned, they were getting fertilizers and feed at higher rates. For cultivation, they needed labor, but due to the lockdown restrictions, they faced difficulties in bringing laborers to the farms. When the crops were harvested, they had to sell them before they got damaged. This was again a problem for them as transport was not available or was available at higher prices. The timings of markets during the lockdown were also an issue for the farmers because they could not reach the distant markets at the time. These circumstances created the need for storage houses, which were again expensive and only available to affluent farmers. Thus, the small-scale farmers were helpless to provide themselves with the facilities needed to keep their crops fresh, and they ended up getting lower rates in the markets. As the farmers mentioned,

“... the fertilizers and weeds were difficult to get ...”, “... labors were unable to reach the farm ...”, “... transport was not available ...”, “... we cannot afford the storage houses we are poor people ...”, “... they were giving low rates ...”.

Influence of COVID-19

COVID-19 and its preventive measures have affected the whole economy. Likewise, it has affected the agricultural sector of Pakistan. The findings of this study suggest that small-scale farmers have faced many difficulties these days which created stress for them. The respondents mentioned,

“... Due to corona, we faced many difficulties ...”, “they used to stop us due to corona while going towards market ...”, “... Due to corona we only faced a shortage in transport ...”, “... problem in bringing labors ...”, “... Rate was also an issue these

days due to which we incurred losses ... ", " ... Rate was also an issue these days due to which we incurred losses ... ".

These were the farmers' grievances due to COVID-19 and the lockdown. The farmers mentioned that they got higher input rates, which increased the cost of cultivation. On the other hand, selling the crops in the markets was difficult due to the strict lockdown schedule, which destroyed crops and lowered the rates given to the farmers. They also faced difficulties in transport and labor because of travel restrictions. The lockdown also affected the daily wage laborers working on the farm because they could not reach the farms through public transport due to the lockdown. However, the laborers who used rental cars or owned vehicles ended up with higher expenses and lower returns because the wage rate was the same, but the expenses increased. Thus, COVID-19 and the lockdown became major external stressors which also intensified the stress created by other sources.

Summary of Data Structures

According to the conclusions of the analysis, the COVID-19 epidemic has caused stress among farmers due to both environmental and internal factors. The analysis discovered two overarching components within the study's theoretical framework: external stressors and internal stressors. Internal stressors included obstacles to farmers' income and productivity, while external stressors included elements such as available resources, external effects such as the COVID-19 epidemic, supply chain interruptions, and market conditions.

Farmers used several coping techniques in reaction to these stressors, leveraging their existing resources such as family labor, on-farm labor accommodation, and self-transportation. Furthermore, they emphasized the importance of collaboration and support from government officials, other farmers, and wholesalers to develop a more resilient system capable of efficiently addressing future crises similar to the COVID-19 pandemic. As a result, these findings add to the current body of knowledge in two ways. They first outline the stressor creation process at three levels and the coping strategy during the COVID-19 pandemic by presenting empirical information acquired from the agricultural sector. Second, they provide a comprehensive data structure (see the "data structure: thematic analysis" model below (Figure 1)) that can guide the entire stress formation and coping system, inform practitioners, consultants, and government authorities, and facilitate the development of strategies aimed at improving sustainability and preparedness in the face of potential future pandemics.

4.2. Secondary Appraisal

Available Resources

According to our analysis, small-scale farmers considered different resources available to them to cope with the stressors mentioned above in the days of the lockdown. Among them, the first one was self-labor and child labor. As one of the farmers mentioned,

"Due to unavailability and additional labor costs, we used to harvest and farm by ourselves. Moreover, we send our children to the farm to plow cotton and wheat flowers".

In response to the circumstances during the lockdown, they were compelled to send their children to the farms for child labor, whereas, according to labor laws, the minimum age for labor is 14 [60].

They also have transport through which they take their produce to the market to worry about. As some farmers said,

"We used to take our products to the market by our transport which includes donkey cart and cargoes", " ... Rickshaw Pullers do this job ... ".

For harvesting, they have laborers and those who do not have sufficient labor go for outsourcing. This was inferred from the statements given by the farmers,

" ... these laborers live with us at our farms ... ", " ... we have many labors in our vicinities ... ", "The labors used to come on the farm by their own or rental bikes".

Some farmers used the technologies available to them, reducing labor costs. As the respondent said,

“... we do everything with machines ...”, “... we cut the crops with thresher and bind them together ...”.

While analyzing the resources for dealing with stressors, they have also mentioned their nearest markets, as some farmers said,

“... the markets are near our farms ...”, “... we sell our products in the markets near our farms”.

Those less-affluent farmers who could not afford the expenses of the warehouses chose to store their crops in their houses.

According to the data we obtained, self-labor/child labor, transportation facilities, laborers, and the nearest markets were some resources that farmers perceived as an option for coping.

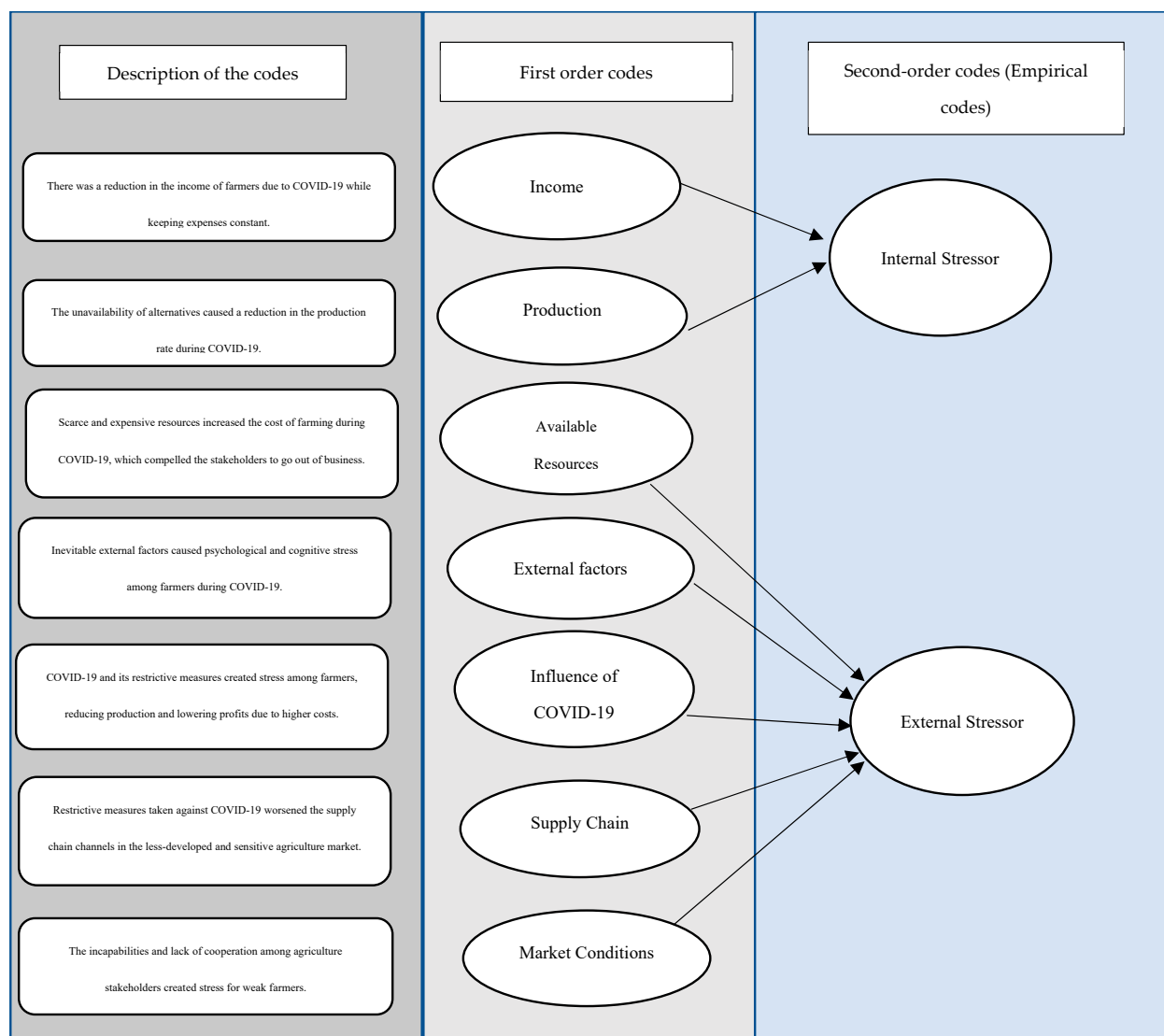


Figure 1. Data structure: Thematic analysis.

4.3. Coping Strategies

The second part of the transactional theory of stress and coping deals with the coping strategies that a person applies through their available resources to reduce the effect of

stressors. Likewise, in our study, we learned about certain options that the small-scale farmers perceived as their coping strategies. There are two types of coping strategies. The first is behavioral, and the second is problem-based coping [43]. Our data show more evidence of problem-based coping where small-scale farmers tried to reduce the effects of their stressors.

According to the data we collected, there were two coping strategies. The first one is the coping strategy that the small-scale farmers have applied in their farms during the lockdown. The second one is the suggested coping strategy they could not apply due to a lack of resources.

4.3.1. Applied Coping Strategies

During the lockdown, the cost of bringing in labor increased. The small-scale farmers used self-labor and child labor to deal with the situation. In response to the question related to harvesting, they said,

“Our children used to go to the farms”.

Child labor is a criminal offense that can lead to punishment and penalties. Further, house storage was a good strategy that they opted for, but it was a temporary solution as they said their crops got damaged after some days,

“... in two to three days, it will not get destroyed, but it happens after 10 to 15 days”.

4.3.2. Suggested Coping Strategies

The respondents suggested that a fully equipped storage house would be a remedy to save crops from any damage resulting from the delayed sale of crops. Moreover, this option was only available to the affluent stakeholders of the agricultural system. Government intervention could eliminate this inequity in the market. Some strategies (mentioned above) were opted for by small-scale farmers. However, they have given some recommendations for the future, which might help many small-scale farmers in the days of a pandemic. According to them, the farmers should avoid taking debt and cultivate the crops they can harvest, given their available resources. Moreover, reducing the cultivation of crops can also help in avoiding losses. As some farmers mentioned,

“The government should have control and monitor the rates”, “... get good rates for the product that’s availability is low in the market and if we bear losses, it will be lesser”.

Summarizing all the respondents’ statements, it can be said that cooperation among small-scale farmers, government, and wholesalers would help reduce the stress of small-scale farmers (Table 1).

Table 1. Issues and possible solutions.

Types of Stressors	Indicated Issues	Responsive Behaviors/Actions	Suggestions of Respondents and the Literature
Income	- Reduction in profits - Low rates - Expensive inputs	Grievances	- Avoid taking debts for cultivation - Control and relief funds from the government
Production	- Low production - Damaged crops - Unavailability of alternatives	- Lowering the rate of cultivation - In-house storage - Personal consumption	- Lowering the rate of cultivation - Control and relief funds from the government
External factors	- Natural disasters (heavy rainfall) - COVID-19 - Lockdown	Uncontrollable	Uncontrollable
Market conditions	- The exploitation of labor (lower rates) - Market unions	- Negotiation with farmers - Owning resources	- Control from government - Cooperation of stakeholders

Table 1. *Cont.*

Types of Stressors	Indicated Issues	Responsive Behaviors/Actions	Suggestions of Respondents and the Literature
Supply chain problems	• Storage losses • Expensive transport • Unavailability of labor	• Child labor • Tying surplus labor to farms • Owning vehicles	• Control from government • Cooperation of stakeholders
Influence of COVID-19	• Lockdown • Restriction • Disturbance in the supply chain	• Grievances	• Control from government • Cooperation of stakeholders

The above table summarizes the study's findings, which include the stressors creating stress among small-scale farmers and the behavior of farmers towards those stressors. Moreover, it also shows some suggestions the farmers gave to manage these stressors.

5. Discussion

The findings of our study suggest that during COVID-19 and the lockdown, small-scale farmers have faced many difficulties and losses; these findings are also supported by [61] in their study conducted in China. Our study explored different factors under three aggregate theoretical themes. Our first theoretical theme is the primary appraisal in which the small-scale farmers evaluated COVID-19 and the lockdown as stressors. The two empirical themes under this theoretical theme are internal and external stressors. The data analysis suggests that small-scale farmers' incomes have decreased due to rainfall (natural disasters), lockdown, and COVID-19, as income is the internal factor for an individual because he has some power over it. So, the decrease in income is considered an internal stressor as Ref. [62] reported that the losses in the net income of farms lead to financial stress, which is sometimes unsustainable for the farmers.

Further, some other researchers reported that low income and poverty lead to stress; they also explained the importance of income-related stress [63,64]. A study conducted in Italy reported that due to the lockdown, national production was affected [16]. Likewise, our study explored production as an internal stressor. Therefore, we formed the following proposition from the first empirical theme of our study.

Proposition 1. *Income and production are considered internal stressors for small-scale farmers in the pandemic.*

The findings of the analysis explain that the restrictive measures of the lockdown have created hindrances in the overall production process by increasing the cost of inputs and labor, which decreased the production capacity of small-scale farmers. Further, Ref. [58] also reported a significant negative impact of the lockdown on agricultural production. This loss in production decreased the farmers' income, creating stress among them; as mentioned above, the income losses led to poverty-related stress [64,65].

The second empirical theme of the primary appraisal is the external stressor. According to the findings of our analysis, heavy rain (natural disasters), COVID-19, and lockdown were some external factors that affected the production and income of small-scale farmers. These external factors have risked the most vulnerable (small-scale farmers) part of the agricultural system [66]. Likewise, small-scale farmers in Pakistan faced more losses from these external factors, which makes the second proposition of our study:

Proposition 2. *Scarce resources, external factors, the influences of COVID-19, supply chain, and market conditions are the external stressors for small-scale farmers in the pandemic.*

These factors disturbed the supply chain of the agricultural system. The restriction in the lockdown created hindrances in the transport system, which delayed the supply of crops to the markets. Ref. [32] reported that the lockdown had created a shortage of labor and transport and brought small-scale farmers to the brink of adversity. This delay caused damage to the crops, thus reducing their rate, which lowered the income of small-scale

farmers. As they have no resources to create advanced storage houses, they also could not afford the rents of large storage houses.

Additionally, the unions of wholesalers in the market exploited them by giving lower production rates. As reported Ref. [61], the external factors (lockdown and COVID-19) have widened the gap between the market and field prices of crops. These factors affected the socioeconomic status of small-scale farmers, and according to Ref. [64], low socioeconomic status creates psychological and physical stress, which badly affects the health of individuals.

The second theoretical theme of our study is secondary appraisal. According to the findings of our analysis, small-scale farmers perceived self-labor/child-labor, migrant farmworkers, their small vehicles, and the nearest markets as their available resources and supply chain strengths. Our study shows that child labor was the first option for the farmers that could not afford or reach the laborers. It was also evident from the study that in Pakistan, significant numbers of children work on farms [67]. Migrant farmworkers are the workers that live on farms away from their residences to earn income. According to our analysis, this option provided easy access to laborers at their farms during the lockdown. However, tying surplus labor to the farms can misallocate production (labor) factors across economic sectors [9].

Moreover, owning vehicles is a cost-effective resource available to farmers. As Ref. [68] reported, owning vehicles can help farmers achieve economies of scale. Lastly, the farmers considered the nearest markets a strength in the days of lockdown. The profitability of this option was also evident from the research conducted by Ref. [69]; according to their results, the nearest markets helped farmers reduce losses from the supply chain. The findings of this study suggested that the small-scale farmers used these available resources to cope with the stressors, which led us to form the following proposition:

Proposition 3. *The available resources paved a direct path between the stressors and applied coping strategies.*

The third and last theoretical theme of our analysis is coping strategies. The findings of our analysis show that the small-scale farmers of Pakistan devised problem-based coping strategies to reduce the impact of their stressors. Moreover, the results show that some of those strategies were applied, and some were suggested. To cope with the problem of costs and labor, they opted for child labor which was a criminal offense. They have also used the available resources mentioned above as their coping strategies. Out of which some were beneficial to reach economies of scale, while some of the strategies they applied were not beneficial for the socioeconomic welfare of the country. However, the suggested coping strategies by the small-scale farmers could have reduced their grievances. Their suggestions include reducing the cost of inputs and providing storage facilities, which would reduce the expenses associated with their crops (increasing their income) and increase the life of their crops (prevention from damage).

The previous studies also supported this suggestion [69,70]. As Ref. [61] reported that government support would be beneficial for stabilizing agriculture production and the income of small-scale farmers. Our respondents also suggested that properly monitoring the rates and relief funds from the government would help them cope with these stressors. Further, the cooperation of wholesalers in the market would also help farmers reduce their stress. Conclusively, the finding of our analysis report that cooperation among the stakeholders of the agricultural system will help small-scale farmers reduce stress. This analysis introduced two more propositions as its contribution to the study,

Proposition 4. *Coping strategies in the transactional theory of stress and coping can be divided into the applied and suggested strategies based on the available resources.*

Proposition 5. *The suggested coping strategies influence the relationship between the available resources and the applied coping strategies.*

These propositions are summarized in Figure 2 below.

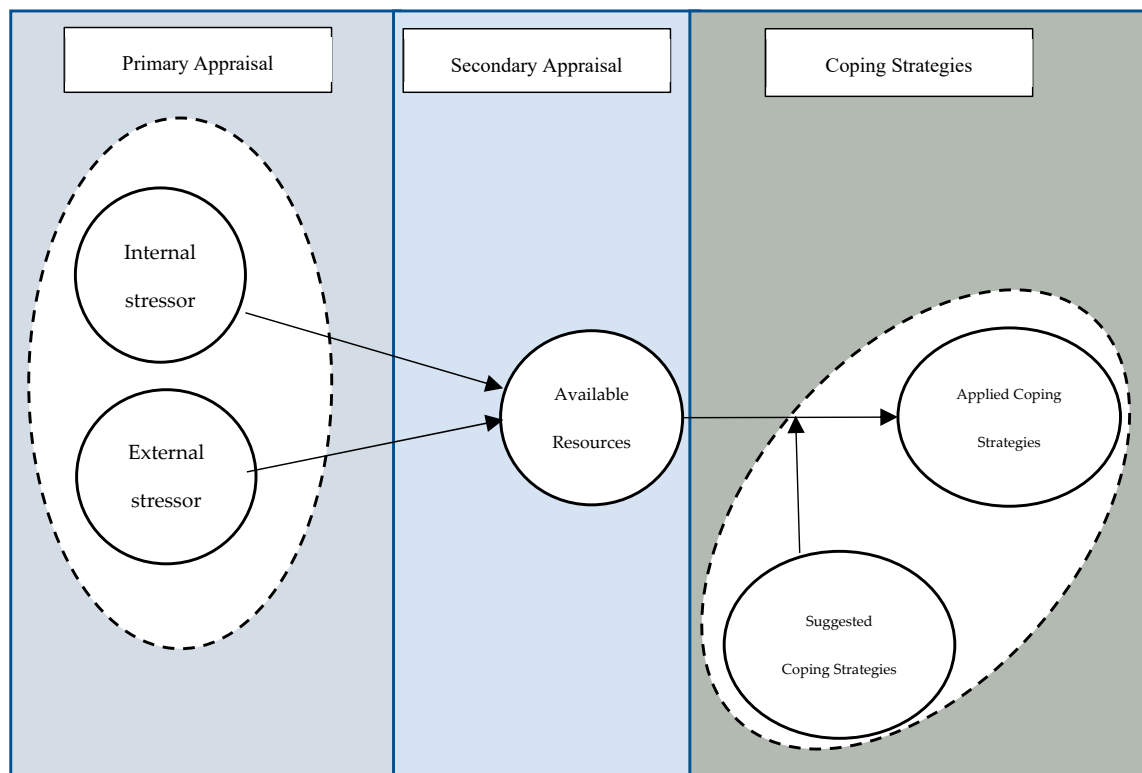


Figure 2. Transactional model of stress and coping among small-scale farmers.

6. Conclusions

This study aims to explore the sources of stress in the lives of small-scale farmers. Moreover, the literature shows that natural disasters and COVID-19 have disrupted the production and consumption of agricultural products. Likewise, COVID-19 and its preventive measures (lockdown) have disrupted the entire agricultural system in Pakistan. This study explores the behavior of small-scale farmers towards COVID-19 and the lockdown. As the initial interview shows that the situation created stress among small-scale farmers, the analysis was conducted under the transactional theory of stress and coping. The analysis findings reveal that small-scale farmers perceived COVID-19 and the lockdown as stress-inducing conditions.

Furthermore, the study's findings explore the internal stressors (income and production) and external stressors (external factors, market conditions, supply chain, and the influence of COVID-19) that have caused panic among the farmers. The study also explores the available resources perceived by small-scale farmers as sources for coping with stress. The analysis findings also highlight some suggestions farmers gave to cope with stress in conditions similar to COVID-19 and the lockdown. This study accurately portrays the stress experienced by small-scale farmers during the pandemic. The findings can be beneficial for practitioners and government officials in preparing for future farmers' sustainability. As COVID-19 has not yet ended, other natural catastrophes may create stress in the future.

This paper addresses the pressing issue of our time, as the third wave of COVID-19 is set to impact the world at large. Moreover, the main contribution of this paper lies in applying the transactional theory of farmers' stress and coping during COVID-19, which sheds light on the conditions faced by small-scale farmers in the agricultural sector during the pandemic. Moreover, this paper builds upon the transactional theory of stress and coping proposed by [39], providing a framework for agricultural researchers, consultants, practitioners, and government authorities to identify stressors affecting farmers during any pandemic. Additionally, it will assist in analyzing the available resources that can

effectively support farmers during these challenging times. Finally, this theory categorizes coping strategies into two subgroups based on the farmers' resource availability: applied coping strategies and suggested coping strategies. These strategies can potentially improve the lives of farmers and the overall system when implemented.

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References

1. Magnusson, K.; Nygård, K.; Vold, L.; Telle, K. Occupational risk of COVID-19 in the 1 st vs. 2 nd wave of infection. *MedRxiv* **2020**, 1–12. [CrossRef]
2. Hassan, S.; Mughal, B.J.; Siwiak, M.; Yasin, Z.; Nilore, P.O. A modified SEIR meta-population transmission-based Modeling and Forecasting of the COVID-19 pandemic in Pakistan. *MedRxiv* **2020**, 6. [CrossRef]
3. Ministry of National Health Services Regulations and Coordination. COVID-19 Health Advisory Platform by Ministry of National Health Services Regulations and Coordination. 2020. Available online: <https://covid.gov.pk/stats/pakistan> (accessed on 20 January 2023).
4. Mazhar, M. Impact of COVID-19 on Pakistan's economic development: A sector-wise analysis. *Am. J. Soc. Sci. Humanit.* **2023**, *8*, 73–88. [CrossRef]
5. Lubchenco, J.; Haugan, P.M. Towards Ocean Equity. In *The Blue Compendium: From Knowledge to Action for a Sustainable Ocean Economy*; Springer International Publishing: Cham, Switzerland, 2023; pp. 485–521.
6. Hasan, M.A.; Shahid, S.; Sultana, M.; Siddiqui, T. Rural Entrepreneurship as a Sustainable Livelihood Alternative for the Returnee Migrants: Reviewing the Potentials and Challenges. *J. Small Bus. Strategy* **2023**, *33*, 20–35. [CrossRef]
7. Wang, Y.; Zhi, B.; Xiang, S.; Ren, G.; Feng, Y.; Yang, G.; Wang, X. China's Biogas Industry's Sustainable Transition to a Low-Carbon Plan—A Socio-Technical Perspective. *Sustainability* **2023**, *15*, 5299. [CrossRef]
8. Sridhar, A.; Balakrishnan, A.; Jacob, M.M.; Sillanpää, M.; Dayanandan, N. Global impact of COVID-19 on agriculture: Role of sustainable agriculture and digital farming. *Environ. Sci. Pollut. Res.* **2023**, *30*, 42509–42525. [CrossRef] [PubMed]
9. Li, K. Property Rights, Land Circulation and Non-Farm Labor Supply: Evidence from a Land Tenure Reform in China. 2020. Available online: <https://ssrn.com/abstract=4000221> (accessed on 20 January 2023).
10. Jamal, S. How will COVID-19 Affect Pakistan Farmers the Food System? | Pakistan–Gulf News. Gulf News. 2020. Available online: <https://gulfnews.com/world/asia/pakistan/how-will-covid-19-affect-pakistan-farmers-food-system-1.71196910> (accessed on 19 January 2023).
11. Lopez-Ridaaura, S.; Sanders, A.; Barba-Escoto, L.; Wiegel, J.; Mayorga-Cortes, M.; Gonzalez-Esquivel, C.; Lopez-Ramirez, M.A.; Escoto-Masis, R.M.; Morales-Galindo, E.; García-Barcena, T.S. Immediate impact of COVID-19 pandemic on farming systems in Central America and Mexico. *Agric. Syst.* **2021**, *192*, 103178. [CrossRef]
12. Rivera-Ferre, M.G.; López-i-Gelats, F.; Ravera, F.; Oteros-Rozas, E.; di Masso, M.; Binimelis, R.; El Bilali, H. The two-way relationship between food systems and the COVID19 pandemic: Causes and consequences. *Agric. Syst.* **2021**, *191*, 103134. [CrossRef]
13. Hammond, J.; Siegal, K.; Milner, D.; Elimu, E.; Vail, T.; Cathala, P.; Gatera, A.; Karim, A.; Lee, J.-E.; Douxchamps, S.; et al. Perceived effects of COVID-19 restrictions on smallholder farmers: Evidence from seven lower-and middle-income countries. *Agric. Syst.* **2022**, *198*, 103367. [CrossRef]
14. Davila, F.; Bourke, R.M.; McWilliam, A.; Crimp, S.; Robins, L.; Van Wensveen, M.; Alders, R.G.; Butler, J.R.A. COVID-19 and food systems in Pacific Island Countries, Papua New Guinea, and Timor-Leste: Opportunities for actions towards the sustainable development goals. *Agric. Syst.* **2021**, *191*, 103137. [CrossRef]
15. Zhan, Y.; Chen, K.Z. Building resilient food system amidst COVID-19: Responses and lessons from China. *Agric. Syst.* **2021**, *190*, 103102. [CrossRef] [PubMed]

16. Rugani, B.; Caro, D. Impact of COVID-19 outbreak measures of lockdown on the Italian Carbon Footprint. *Sci. Total Environ.* **2020**, *737*, 139806. [CrossRef]
17. Pappas, S.; American Psychological Association. COVID-19 Fallout Hits farmers. 2020. Available online: <https://www.apa.org/topics/covid-19/farming-communities-stress> (accessed on 20 January 2023).
18. Plecher, H. Pakistan-GDP Distribution across Economic Sectors 2019 | Statista. 2020. Available online: <https://www.statista.com/statistics/383256/pakistan-gdp-distribution-across-economic-sectors/> (accessed on 25 January 2023).
19. Qayyum, F. Pakistan's economy, trade and management—An overview. *Int. J. Commer. Manag.* **2001**, *11*, 18. [CrossRef]
20. Gov. Chapter 2. 2019. Available online: http://www.finance.gov.pk/survey/chapters_18/02-Agriculture.pdf (accessed on 15 January 2023).
21. Trading Economics. Pakistan-Rural Population—1960–2019 Data | 2021 Forecast. Trading Economics. 2021. Available online: <https://tradingeconomics.com/pakistan/rural-population-percent-of-total-population-wb-data.html> (accessed on 25 January 2023).
22. Gov. Population, Labour Force and Employment. 2017. Available online: http://www.finance.gov.pk/survey/chapters_16/12-Population.pdf (accessed on 15 January 2023).
23. Thirtle, C.; Lin, L.; Piesse, J. The impact of research-led agricultural productivity growth on poverty reduction in Africa, Asia, and Latin America. *World Dev.* **2003**, *31*, 1959–1975. [CrossRef]
24. Azam, A.; Shafique, M. Agriculture in Pakistan and its Impact on the Economy. A Review. *Inter. J. Adv. Sci. Technol.* **2017**, *103*, 47–60. [CrossRef]
25. The World Economy is in Deep Recession in 2020, Growth to be -4.4% : IMF-Times of India. The Times of India. 2020. Available online: <https://timesofindia.indiatimes.com/business/international-business/world-economy-in-deep-recession-in-2020-growth-to-be-4-4-imf/articleshow/78643065.cms> (accessed on 25 January 2023).
26. Blackshaw, T.; Crawford, G.; Wilson, R. *World Economic Situation and Prospects*; United Nations: New York, NY, USA, 2020. [CrossRef]
27. The World Bank. Agriculture, Forestry, and Fishing, Value Added (% of GDP)-Pakistan | Data. The World Bank. 2019. Available online: <https://data.worldbank.org/indicator/NV.AGR.TOTL.ZS?end=2019&locations=PK&start=2011> (accessed on 25 January 2023).
28. Zhou, F.; Yu, T.; Du, R.; Fan, G.; Liu, Y.; Liu, Z.; Xiang, J.; Wang, Y.; Song, B.; Gu, X. Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: A retrospective cohort study. *Lancet* **2020**, *395*, 1054–1062. [CrossRef]
29. Fernandes, N. Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy. 2020. Available online: https://www.google.com.hk/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwilhcv11Mv_AhUYAd4KHcNoAHUQFnoECB8QAQ&url=https%3A%2F%2Fedisciplinas.usp.br%2Fpluginfile.php%2F5662406%2Fmod_resource%2Fcontent%2F1%2FFERNANDES_Economic%2520Effects%2520of%2520Coronavirus%2520Outbreak%2520%2528COVID19%2529%2520on%2520the%2520World%2520Economy.pdf&usq=AOvVaw1w0fXV75BMQXzIBZjdiHX&opi=89978449 (accessed on 12 January 2023).
30. International Monetary Fund. *World Economic Outlook Update*; International Monetary Fund: Washington, DC, USA, 2021.
31. PTI. Pakistan's Economy Contracts for the First Time in 68 Years by -0.38% -The Economic Times. The Economic Times. 2020. Available online: <https://economictimes.indiatimes.com/news/international/business/pakistans-economy-contracts-for-first-time-in-68-years-by-0-38/articleshow/76325063.cms?from=mdr> (accessed on 25 January 2023).
32. Ali, I. COVID-19: Are We Ready for the Second Wave? *Disaster Med. Public Health Prep.* **2020**, *14*, e16–e18. [CrossRef] [PubMed]
33. Selye, H. *Stress*. Ed. *Scientifiche Einaudi*; Butterworths: London, UK, 1957.
34. Moberg, G.P. Biological response to stress: Implications for animal welfare. In *The Biology of Animal Stress: Basic Principles and Implications for Animal Welfare*; CABI Publishing: Wallingford, UK, 2000; pp. 1–21.
35. Dhabhar, F.S. The power of positive stress—a complementary commentary. *Stress* **2019**, *22*, 526–529. [CrossRef]
36. Pakistan Jobs. Impact of Coronavirus on the Economy of Pakistan: Pakistan Jobz. 2020. Available online: <https://www.pakistanjobz.pk/impact-of-coronavirus-on-the-economy-of-pakistan/> (accessed on 19 January 2023).
37. MacIntyre, P.D.; Gregersen, T.; Mercer, S. Language teachers' coping strategies during the COVID-19 conversion to online teaching: Correlations with stress, well-being and negative emotions. *System* **2020**, *94*, 102352. [CrossRef]
38. Renukamurthy, T.P. Stress among banking employee-A literature review. *Int. J. Res.-Granthaalayah* **2017**, *5*, 206–213.
39. Lazarus, R.S.; Folkman, S. Stress, Appraisal, and Coping. 1984. Available online: <http://www.dawsonera.com/depp/reader/protected/external/AbstractView/S9780826141927> (accessed on 19 January 2023).
40. Granger, D.A.; Johnson, S.B. Encyclopedia of Behavioral Medicine. In *Encyclopedia of Behavioral Medicine*; Springer: Berlin/Heidelberg, Germany, 2013. [CrossRef]
41. Islam, S.M.D.U.; Bodrud-Doza, M.; Khan, R.M.; Haque, M.A.; Mamun, M.A. Exploring COVID-19 stress and its factors in Bangladesh: A perception-based study. *Heliyon* **2020**, *6*, 1–10. [CrossRef] [PubMed]
42. Pakpour, A.; Griffiths, M. The fear of COVID-19 and its role in preventive behaviors. *J. Concurr. Disord.* **2020**, *2*, 58–63.
43. Gerhold, L. COVID-19: Risk Perception and Coping Strategies. In *Results from a Survey in Germany*; Interdisciplinary Security Research Group: Luxembourg, 2020; pp. 1–11.
44. Allen, M.; Axelsson, K.; Caldecott, B.; Hale, T.; Hepburn, C.; Hickey, C.; Mitchell-Larson, E.; Malhi, Y.; Otto, F.; Seddon, N.; et al. *The Oxford Principles for Net Zero Aligned Carbon Offsetting*; University of Oxford: Oxford, UK, 2020.

45. Afshar Badr, Z.; Shirzad Kebria, B.; Khosravi, P.; Kordestani, F. Identifying health literacy factors for hypertensive patients with Demetel and Content analysis. *Educ. Adm. Res.* **2022**, *13*, 59–76.
46. Zaman, U.; Nawaz, S.; Anjam, M.; Anwar, R.S.; Siddique, M.S. Human resource diversity management (HRDM) practices as a coping mechanism for xenophobia at transnational workplace: A case of a multi-billion-dollar economic corridor. *Cog. Bus. Manag.* **2021**, *8*, 1883828. [\[CrossRef\]](#)
47. Williams, M.; Moser, T. The Art of Coding and Thematic Exploration in Qualitative Research. *Int. Manag. Rev.* **2019**, *15*, 45–55.
48. Anwar, R.S.; Channa, K.A.; Shah, S.M.M. Scope of Combining the Research Methods in Human Resource Management (HRM) and Organizational Behavior (OB). *Indian J. Econ. Bus.* **2021**, *20*. [\[CrossRef\]](#)
49. APP. Government to Continue Smart Lockdown Policy during Second Wave of COVID-19: Asad Umar. The Nation. 2020. Available online: <https://nation.com.pk/03-Nov-2020/government-to-continue-smart-lockdown-policy-during-second-wave-of-covid-19-asad-umar> (accessed on 5 January 2023).
50. Bhutto, A.W.; Bazmi, A.A. Sustainable Agriculture and Eradication of Rural Poverty in Pakistan. *Nat. Resour. Forum* **2007**, *31*, 253–262. [\[CrossRef\]](#)
51. Boddy, C.R. Sample size for qualitative research. *Qual. Mark. Res.* **2016**, *19*, 426–432. [\[CrossRef\]](#)
52. Warren, C.A.B. *Handbook of Interview Research*; Sage: London, UK, 2011. [\[CrossRef\]](#)
53. Baker, M. Early childhood teachers at the center: A qualitative case study of professional development in an urban district. *Early Child. Educ. J.* **2018**, *46*, 231–240. [\[CrossRef\]](#)
54. Brondolo, E.; Byer, C.K.J.; Gianaros, P.; Liu, C.; APrather, A.; Thomas, K.; Woods-Giscombé, C. Stress and Health Disparities. 2017. Available online: <https://www.apa.org/pi/health-disparities/resources/stress-report.pdf> (accessed on 10 January 2023).
55. Ceballos, F.; Kannan, S.; Kramer, B. Impacts of a national lockdown on smallholder farmers' income and food security: Empirical evidence from two states in India. *World Dev.* **2020**, *136*, 105069. [\[CrossRef\]](#)
56. Tamru, S.; Hirvonen, K.; Minten, B.; International Food Policy Research Institute. Impacts of the COVID-19 Crisis on Vegetable Value Chains in Ethiopia | IFPRI: International Food Policy Research Institute. 2020. Available online: <https://www.ifpri.org/blog/impacts-covid-19-crisis-vegetable-value-chains-ethiopia> (accessed on 25 January 2023).
57. OECD. COVID-19 and the Food and Agriculture Sector: Issues and Policy Responses. OECD. 2020. Available online: https://read.oecd-ilibrary.org/view/?ref=130_130816-9uut45lj4q&title=Covid-19-and-the-food-and-agriculture-sector-Issues-and-policy-responses (accessed on 20 January 2023).
58. Pu, M.; Zhong, Y. Rising concerns over agricultural production as COVID-19 spreads Lessons from China. *Glob. Food Secur.* **2020**, *26*, 100409. [\[CrossRef\]](#)
59. Cavallo, E.; Noy, I. Natural disasters and the economy—A survey. *Int. Rev. Environ. Resour. Econ.* **2011**, *5*, 63–102. [\[CrossRef\]](#)
60. ILAB. *Findings on the Worst Forms of Child Labor-Pakistan* | US; Department of Labor: Washington, DC, USA, 2019. Available online: <https://www.dol.gov/agencies/ilab/resources/reports/child-labor/pakistan> (accessed on 17 January 2023).
61. Gu, H.Y.; WANG, C.W. Impacts of the COVID-19 pandemic on vegetable production and countermeasures from an agricultural insurance perspective. *J. Integr. Agric.* **2020**, *19*, 2866–2876. [\[CrossRef\]](#)
62. Briggeman, B.C. *Debt, Income, and Farm Financial Stress*; Federal Reserve Bank of Kansas City: Kansas City, MO, USA, 2020.
63. McLoyd, V.C. The impact of economic hardship on Black families and children: Psychological distress, parenting, and socioemotional development. *Child Dev.* **1990**, *61*, 311–346. [\[CrossRef\]](#)
64. Wadsworth, M.E. Working with low-income families: Lessons learned from basic and applied research on coping with poverty-related stress. *J. Contemp. Psychother.* **2012**, *42*, 17–25. [\[CrossRef\]](#)
65. Laferton, J.A.C.; Stenzel, N.M.; Fischer, S. The Beliefs About Stress Scale (BASS): Development, reliability, and validity. *Int. J. Stress Manag.* **2018**, *25*, 72. [\[CrossRef\]](#)
66. Qian, Y.; Fan, W. Who loses income during the COVID-19 outbreak? Evidence from China. *Res. Soc. Stratif. Mobil.* **2020**, *68*, 100522. [\[CrossRef\]](#)
67. Bhalotra, S.; Heady, C. Child farm labor: The wealth paradox. *World Bank Econ. Rev.* **2003**, *17*, 197–227. [\[CrossRef\]](#)
68. Tatsiopoulous, I.P.; Tolis, A.J. Economic aspects of the cotton-stalk biomass logistics and comparison of supply chain methods. *Biomass Bioenergy* **2003**, *24*, 199–214. [\[CrossRef\]](#)
69. Amentae, T.K.; Hamo, T.K.; Gebresenbet, G.; Ljungberg, D. Exploring Wheat Value Chain Focusing on Market Performance, Post-Harvest Loss, and Supply Chain Management in Ethiopia: The Case of Arsi to Finfinnee Market Chain. *J. Agric. Sci.* **2017**, *9*, 22. [\[CrossRef\]](#)
70. Haq, U.M. Addressing the Impact of COVID-19 Lockdown on Agriculture, Food Security and Livelihoods in Pakistan. *Curr. Trends Eng. Sci.* **2020**, *1*, 1002. [\[CrossRef\]](#)

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